AllFusion® Process Modeler

IDEF3 Mappings

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Chapter

1

IDEF3 to Arena BE Mappings

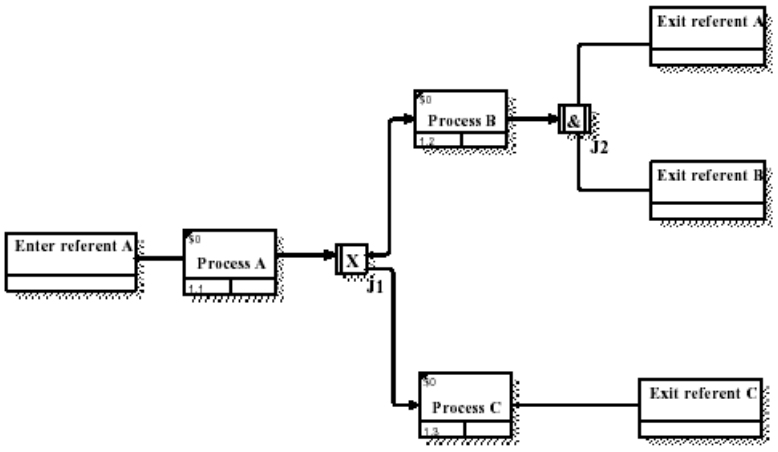
IDEF3 Process Flow Networks to Arena BE Mappings

This document describes the potential content of an AllFusion® Process Modeler (hereafter referred to as AllFusion PM) IDEF3 flow network and how this may map to a Rockwell Software, Inc. Arena® BE model.

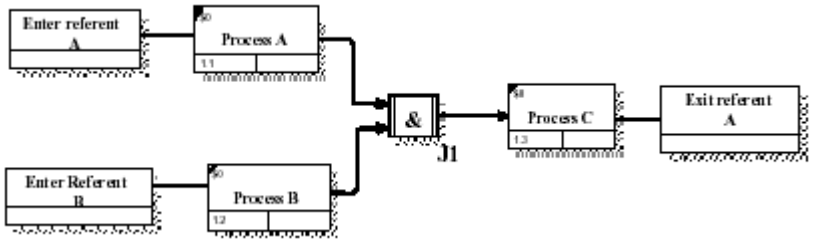
Important points to note:

- The interface maps a single IDEF3 diagram to a single Arena BE model (hierarchy is not supported).
- Not all objects in an IDEF3 diagram will necessarily map to an Arena BE model.
- Not all objects in an Arena BE model can be modeled in an IDEF3 model.

The objective is to include what makes best sense in terms of both tools. The following diagram shows the basic set of IDEF3 objects that may be exchanged:



The following diagram shows a fan-in to a junction. In an actual model, a mixture of fan-in and fan-out situations can occur. Arena BE has specific objects that handle these situations. For more information on the specific objects, see the following mapping tables.



Base Mapping Table

The following table describes the base mapping for AllFusion PM and Arena BE objects:

AllFusion PM Object	Arena BE Object	Comments
Referent (Link From)	Create Module	AllFusion PM Link (arrow) style is modified so that arrow head can display
Referent (Link To)	Dispose Module	AllFusion PM Link (arrow) style is modified so that arrow head can display
UOB (IDEF3 activity)	Process Module	None
Junction (XOR or Sync OR)	Decide Module	Only allows two outgoing links (all others are rejected by the interface) but greater than two incoming
Junction (AND or Async OR) where links (arrows) fan-in	Batch Module	Can be considered a "special" activity if needed by using UDPs (user-defined properties) to designate
Junction (AND or Async OR) where links (arrows) fan-out	Separate Module	Only allows two outgoing links (all others are rejected by the interface)

AllFusion PM Object	Arena BE Object	Comments
Any diagram object dictionary object	Resource Module	Dictionary objects are used only to store resource rows and there is no association between the data and the object on which it is stored
Arrows (inputs to UOBs representing Process Modules)	Resource or Set repeat group	Data is associated with the Process Module into which the arrow sinks; sets are not supported
Not required; see comments	Simulate Module	Created by the interface
No direct equivalent	Assign Module	Can be considered a "special" activity if needed by using UDPs to designate
No direct equivalent	Record Module	No equivalent possible

The methodology of UDPs attached to the appropriate object is used to set parameters in the AllFusion PM model before interchange. The following sections define the requirements by object type.

Arena Create Module and AllFusion PM Referent (Link From)

The following table describes the requirements for the Arena Create Module and the AllFusion PM Referent (Link From):

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Name	Unique name	Referent Name	Not applicable	Not applicable	Not applicable
Entity type	Name of the entity type that will be generated	UDP	Arena_C_EntityType	Text	Not applicable
Type	Arrival stream type	UDP	Arena_C_ArrivalType	SS Text List	■ Constant ■ Expression ■ Random ■ Schedule
Value	Mean of exponent when Random or Constant	UDP	Arena_C_Value	Real	Not applicable
Schedule Name	Name of schedule if type schedule	UDP	Arena_C_ScheduleName	Text	Not applicable

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Expression	Distribution or value for time between arrivals	UDP	Arena_C_Expression	Text	Not applicable
Units	Type of time units	UDP	Arena_C_Units	SS Text List	■ Days ■ Hours ■ Minutes ■ Seconds
Entities per arrival	Number of entities entering at a given time	UDP	Arena_C_EntitiesPerArrival	Real	Not applicable
Max Arrivals	Maximum number of entries that this module will initiate	UDP	Arena_C_MaxArrivals	Text	Not applicable
First Creation	Starting time for first arrival	UDP	Arena_C_FirstCreation	Text	Not applicable

Arena Process Module and AllFusion PM UOB (IDEF3 Activity)

The following table describes the requirements for the Arena Process Module and the AllFusion PM UOB (IDEF3 Activity):

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Name	Unique name	Activity Name	Not applicable	Not applicable	Not applicable
Type	Method of logic	UDP	Arena_P_Type	SS Text List	■ Standard ■ Submodel
Action	Processing type	UDP	Arena_P_Action	SS Text List	■ Delay ■ Delay Release ■ Seize Delay ■ Seize Delay Release
Priority	Priority value	UDP	Arena_P_Priority	Text	Not applicable
Resources	Repeat group of resources	UDP version 2.5	Arena_P_Resources	MS Text List	Set by user
Delay Type	Distribution type for delay parameters	UDP	Arena_P_DelayType	SS Text List	■ Constant ■ Expression ■ Normal ■ Triangular ■ Uniform
Units	Time units for delay parameters	UDP	Arena_P_Units	SS Text List	■ Days ■ Hours ■ Minutes ■ Seconds
Allocation	How processing time is allocated	UDP	Arena_P_Allocation	SS Text List	■ Non-value added ■ Value added

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Minimum	Minimum value for Uniform or Triangular distribution	UDP	Arena_P_Minimum	Text	Not applicable
Value	Mean for Normal, Value for Constant, Mode for Triangular	UDP	Arena_P_Value	Text	Not applicable
Maximum	Maximum value for Uniform or Triangular distribution	UDP	Arena_P_Maximum	Text	Not applicable
Std Dev	Std Dev for Normal distribution	UDP	Arena_P_Std Dev	Text	Not applicable
Expression	Value of expression type	UDP	Arena_P_Expression	Text	Not applicable

Arena Decide Module and AllFusion PM Junction (XOR or Sync OR)

The following table describes the requirements for the Arena Decide Module and the AllFusion PM Junction (XOR or Sync OR):

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Name	Unique name	Junction Name	Not applicable	Not applicable	Not applicable
Type	Type of decision	UDP	Arena_?_Type	SS Text List	■ By chance ■ By condition
Percent True	Value percent to be checked and sent down to the True/False exit points	UDP	Arena_?_PercentTrue	Text	Not applicable
If	Types of conditions available for evaluation	UDP	Arena_?_ConditionType	SS Text List	■ Attribute ■ Entity Type ■ Expression ■ Variable
VNamed	Name of variable used in conditional statement	UDP version 2.5	Arena_?_VariableName	Text	Not applicable
ANamed	Name of attribute used in conditional statement	UDP	Arena_?_AttributeName	Text	Not applicable

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
TypeNamed	Name of Entity Type used in conditional statement	UDP	Arena_?_EntityName	Text	Not applicable
Is	Evaluator	UDP	Arena_?_ConditionEvaluator	SS Text List	■ < ■ <= ■ <> ■ == ■ > ■ >=
Value	Expression used for condition	UDP	Arena_?_ConditionValue	Text	Not applicable

Note: For more information on this table, see the conditions in the Base Mapping Table.

Arena Batch Module and AllFusion PM Junction (AND or Async OR)

AND or Async OR where the links (arrows) fan-in. The following table describes the requirements for the Arena Batch Module and the AllFusion PM Junction (AND or Async OR):

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Name	Unique name	Junction Name	Not applicable	Not applicable	Not applicable
Type	Batch type	UDP	Arena_B_Type	SS Text List	■ Permanent ■ Temporary
Batch size	Number of entities	UDP	Arena_B_BatchSize	Text	Not applicable
Rule	How batched	UDP	Arena_B_Rule	SS Text List	■ Any entity ■ By attribute
Attribute name	Name if Rule set to By attribute	UDP	Arena_B_AttributeName	Text	Not applicable

Arena Separate Module and AllFusion PM Junction (AND or Async OR)

AND or Async OR where the links (arrows) fan-out. The following table describes the requirements for the Arena Separate Module and the AllFusion PM Junction (AND or Async OR):

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Name	Unique name	Junction Name	Not applicable	Not applicable	Not applicable
Type	Separation method type	UDP	Arena_S_Type	SS Text List	■ Duplicate original ■ Split existing batch
Percent cost to duplicates	Percent of entities' original cost	UDP	Arena_S_PercentCostToDuplicates	Text	Not applicable
Number of duplicates	Number of outgoing that will leave in addition	UDP	Arena_S_#ofDuplicates	Text	Not applicable
Allocation Rule	Method of cost and allocation time	UDP	Arena_S_AllocationRule	SS Text List	■ Do not split costs and times ■ Split all costs and times ■ Split only new costs and times

Note: For more information on this table, see the conditions in the Base Mapping Table.

Arena Assign Module and AllFusion PM UOB

The following table describes the requirements for the Arena Assign Module and the AllFusion PM UOB (Arena BE object type = Assign) ? Future:

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Name	Unique name	Activity name	Not applicable	Not applicable	Not applicable
Type	Assignment type	UDP	Arena_A_Type	SS Text List	■ Attribute ■ Entity picture ■ Entity type ■ Other ■ Variable
Variable name	Name if a variable	UDP	Arena_A_VariableName	Text	Not applicable
Attribute name	Name if an attribute	UDP	Arena_A_AttributeName	Text	Not applicable

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Entity Type name	Name if an Entity Type	UDP	Arena_A_EntityType	Text	Not applicable
Entity Picture name	Name if an Entity Picture	UDP	Arena_A_EntityPictureName	Text	Not applicable
Other name	Name if Other	UDP	Arena_A_OtherName	Text	Not applicable
New Value	Assignment value if not Entity Type or Entity Picture	UDP	Arena_A_NewValue	Text	Not applicable

Arena Resource Module and AllFusion PM UOB

The following table describes the requirements for the Arena Resource Module and the AllFusion PM UOB (Arena BE object type = Resource):

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Name	Unique name	UDP	Arena_Res_Name	Text	Not applicable
Type	Resource type	UDP	Arena_Res_Type	SS Text List	■ Fixed capacity ■ Based on schedule
Capacity	Capacity	UDP	Arena_Res_Capacity	Text	Not applicable
Schedule name	Schedule name	UDP	Arena_Res_ScheduleName	Text	Not applicable
Busy/Hour	BusyPerHour	UDP	Arena_Res_BusyPerHour	Real	Not applicable
Idle/Hour	IdlePerHour	UDP	Arena_Res_IdlePerHour	Real	Not applicable
Per Use	PerUse	UDP	Arena_Res_PerUse	Real	Not applicable

Arena Resource Repeat Group and AllFusion PM Arrow

The following table describes the requirements for the Arena Resource Repeat Group and the AllFusion PM Arrow (Arena BE object type = Resource Repeat Group):

Prompt Name	Description	AllFusion PM Meta Property	UDP Name	UDP Datatype	UDP Value List
Type	ResourceType	UDP	Arena_ResGroup_Type	SS Text List	■ Resource ■ Set
Resource Name	ResourceName	UDP	Arena_ResGroup_ResName	Text	Not applicable
Set Name	SetName	UDP	Arena_ResGroup_SetName	Text	Not applicable
Quantity	Quantity	UDP	Arena_ResGroup_Quantity	Text	Not applicable
Selection Rule	SelectionRule	UDP	Arena_ResGroup_SelectionRule	SS Text List	■ Cyclical ■ Random ■ Preferred Order ■ Specific Member ■ Largest Remaining Capacity ■ Smallest Number Busy
Save Attribute	SaveAttribute	UDP	Arena_ResGroup_SaveAttr	Text	Not applicable
Input Attribute	InputAttribute	UDP	Arena_ResGroup_InputAttr	Text	Not applicable